

IN THE CLAIMS:

1. (Currently Amended) A microlithography method for coating a deep-
featured substrate with a uniform thickness of photoresist, comprising:

preparing a mixed solvent based resist from a photoresist solution and a
solvent having a higher volatility rate than the photoresist solution, the mixed solvent
based resist having a viscosity between about one and about three centipoises;

rotating a substrate at a predefined speed,~~the substrate having a first~~
~~surface;~~

spraying the mixed solvent based resist through a spray nozzle ~~coating the~~
~~first~~ onto a surface of the substrate ~~with a negative-tone photoresist-solvent solution at an~~
~~a spray~~ angle to the ~~first-surface of less than 90 degrees~~ to obtain coverage of deep-etched
~~features, the solvent having a higher volatility rate than the negative-tone photoresist, the~~
~~negative-tone photoresist to solvent ratio being in the range of one to three and one to~~
~~five and a half and having a viscosity of between one and three centipoises; and~~

moving a accelerating the spray nozzle diametrically ~~across the diameter~~
~~of the first surface of the substrate at varying speeds to achieve a negative-tone~~
~~photoresist coat of substantially the same uniform thickness throughout the first surface.~~

2. (Currently Amended) The method of claim 1 further comprising:
priming the first surface of the substrate with a primer having to achieve a
water contact angle between about forty and about fifty degrees.

3. (Currently Amended) The method of claim 2 wherein, ~~once primed, the photoresist can be sprayed~~ the spraying step further comprises spraying in an environment[[s]] having relative humidity levels as high as sixty lower than fifty percent.

4. (Currently Amended) The method of claim 1 wherein the ~~negative-tone photoresist solution~~ is a ~~cyclohexanone-based negative-tone resist~~ and the solvent is ~~methyl-ethyl-ketone solution~~ and wherein the photoresist solution-to-solvent ratio is in a range between about one-to-three and about one-to-five-and-a-half.

5-7. (Canceled)

8. (Currently Amended) The method of claim ~~5~~ 1 wherein the ~~positive-tone photoresist solution~~ is a ~~propylene glycol monomethyl ether acetate-based positive-tone resist~~ and the solvent is methyl-ethyl-ketone solution and wherein the photoresist solution-to-solvent ratio is in a range between about one-to-five and about one-to seven.

9. (Currently Amended) The method of claim ~~5~~ 1 wherein the substrate includes deep etched features are deeper than 20 μm , and wherein the photoresist coat of substantially uniform thickness coats the deep etched features.

10. (Currently Amended) The method of claim ~~5~~ 2 wherein the deep etched features are deeper than 200 μm .

11. (Currently Amended) A method for coating photoresist on a substrate having deep etched features, comprising:

cleaning immersing the substrate ~~by immersing it~~ into a cleaning solution;

rinsing the substrate in ultrapure water;
thoroughly drying the substrate;
priming coating the substrate with a primer by immersing it into a priming solution, ~~the priming solution having a water contact angle of between forty and fifty degrees;~~

rinsing the substrate in ultrapure water to remove excess priming solution;
thoroughly drying the substrate; and
spraying a mixed solvent based resist through a spray nozzle coating the ~~onto a surface of the~~ substrate with a photoresist, ~~wherein the photoresist is sprayed at an~~ a spray angle to the substrate surface of less than 90 degrees.

12. (Currently Amended) The method of claim 11 wherein
the ~~substrate is immersed into a~~ cleaning solution of comprises a peroxide-sulfuric solution,

wherein the immersing step is performed for a duration of ~~for~~ five to fifteen minutes, and

wherein the first rinsing step is performed for a duration of ~~substrate is~~ rinsed in ultrapure water for five to ten minutes.

13. (Currently Amended) The method of claim 11 wherein the deep etched features are deeper than 20 μm , and wherein the mixed solvent based resist achieves a coat of substantially uniform thickness along surfaces of the deep etched features.

14. (Currently Amended) The method of claim ~~11~~ 13 wherein the deep etched features are deeper than 200 μm .

15. (Currently Amended) The method of claim 11 wherein the ~~priming solution has~~ second drying step produces a primed substrate surface having a water contact angle of between about forty and about fifty degrees.

16. (Currently Amended) The method of claim 11 wherein, ~~once primed~~, the photoresist ~~can be sprayed~~ spraying step further comprises spraying the mixed solvent based resist in an environment[[s]] having relative humidity levels ~~as high as sixty~~ lower than fifty percent.

17. (Currently Amended) The method of claim 11 wherein the ~~photoresist is~~ mixed solvent based resist comprises a negative-tone photoresist solution ~~that is~~ diluted with a solvent, the negative-tone photoresist solution-to-solvent ratio being in ~~the a~~ range of between about one-to-three and about one-to-five-and-a-half.

18. (Currently Amended) The method of claim 11 wherein the ~~photoresist is~~ mixed solvent based resist comprises a positive-tone photoresist solution ~~that is~~ diluted with a solvent, the positive-tone photoresist solution-to-solvent ratio being in ~~the a~~ range of between about one-to-five and about one-to-seven.

19. (New) The method of claim 1 wherein the solvent comprises methyl-ethyl-ketone.

20. (New) The method of claim 4 wherein the negative-tone resist solution is cyclohexanone solvent based.

21. (New) The method of claim 8 wherein the positive-tone resist solution is propylene glycol monomethyl ether acetate solvent based.

22. (New) A microlithography method for coating a deep-featured substrate surface with a uniform thickness of photoresist, comprising:

applying a primer coat to the substrate surface to create a primed substrate surface having a water contact angle of between about forty and about fifty degrees;

rotating the substrate at a predefined speed;

spraying a mixed solvent based resist through a spray nozzle onto the primed surface at a spray angle to the primed surface of less than 90 degrees, the mixed solvent based resist having a viscosity between about one and about three centipoises; and

accelerating the spray nozzle diametrically across the substrate surface to achieve a photoresist coat of substantially uniform thickness.

23. (New) The method of claim 22 wherein the mixed solvent based resist comprises a photoresist solution and a solvent having a higher volatility rate than the photoresist solution, the photoresist solution-to-solvent ratio being in a range of about one-to-three and about one-to-seven.